



US EPA OECA AIR INSPECTION REPORT

Inspection Dates: **September 26 – 30, 2016**

Type of inspection: **Clean Air Act, Partial Compliance Evaluation**
Company Name: **Southwestern Energy**
Facility Names: **Marcellus Shale Oil and Gas Production Sites**
Physical Location: **179 Innovation Drive
Jane Lew, WV 26378
Sites: Ohio County, WV**
Mailing Address: **179 Innovation Drive
Jane Lew, WV 26378**

County/Parish: **Tyler County**
Reg. Programs: **SIP, NSPS OOOOa**
SIC Code: **1311, 1321**

Facility Representatives:

Clayton Murrall	Regulatory Supervisor
Christian Allison	Senior Staff Production Engineer
Franklin Brabham	Senior Regulatory Technician

EPA Inspectors:

Stephen Rieck	Environmental Scientist	404-562-9177
Nikki Radford	Environmental Specialist	404-562-9099

EPA

Inspector:

Stephen Rieck (Date)

EPA

Inspector:

Nikki Radford (Date)

EPA

Inspector:

Zelma Maldonado (Date)

Summary

This inspection report is comprised of two sections:

- **Section I – Introduction** includes the following topics:
 - Purpose of the Inspection
 - Facility Description
- **Section II – Observations**
 - Well-site inventory and observations
- **Section III - Closing Conference**
- **Section IV – Conclusion and Areas of Concern**

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

On September 20, 2017, Nikki Radford and Stephen Rieck met with staff of Southwestern Energy (SWN). The inspection team presented credentials and described the purpose of the inspection.

The inspection objective was to visit as many multi-well production facilities as practical. Through FLIR camera optical gas imaging and photoionization detection (PID), the inspection team surveyed the extent of excess VOC emissions from storage tanks, valves, combustors, gas processing units, and other process equipment.

The team discusses safety protocols and identified emergency muster points at each site.

FACILITY AND PROCESS DESCRIPTION

SWN's multi-well production facilities have storage tanks and other equipment that process the natural gas and liquids, including produced water, from multiple wells. The facilities have gas processing units (GPUs) that operate as separators, heater-treaters, and flares or combustors for control. The tanks contain liquid condensates and produced water.

Natural gas liquids come into the well and are sent to gas processing units (GPUs). The GPUs separate the material into gas, condensates and water. The gas is sent to the sales line and the water is sent to produced water tanks. The condensates are further separated in the heater treater and vapor recovery towers. The tanks are controlled with sealed tank hatches and pressure relief devices. Vapor emissions that gather in the headspace of the tanks are sent to a combustor for destruction.

Section II – OBSERVATIONS

We conducted our ground-level emissions surveys using the following equipment:

- IR camera manufactured by FLIR, Model GF320. Operated by Nikki Radford
- PID manufactured by Ion Science called the "PhoCheck TIGER." NOTE: PIDs cannot measure methane or ethane, readings with the PID are significantly lower than the actual VOC concentration. Operated by Steve Rieck.
- QRAE III personal safety monitors. Operated by both Nikki Radford and Steve Rieck.

Sites owned SWN and inspected by EPA

(Note: Site names are based on property ownership)

Site Name(s)	OCC-A
Lat/Long	40.0894 / -80.6003
Date/Time	09/20/17 @ 1:20 am
Equipment	2 wells, 2 GPUS, 6 tanks, 1 combustor, 1 compressor
FLIR MOV_	_0333 – emissions from compressor vent
Notes	No emissions noted from tanks or combustor. Combustor operating with pilot light. Wellsite has a high production rate and constant truck unloading may prevent vapor buildup in tanks.

Site Name(s)	Alice Edge
Lat/Long	39.7397 / -80.4944
Date/Time	09/20/17 @ 2:21 pm
Equipment	11 wells, 11 GPUS, 16 tanks, 1 combustor, 3 heater treaters, 2 compressors
FLIR MOV_	_0334 – “Quick release” GPU Vent
Notes	<p>Production: 200 mmcf gas/day 700 bbls oil/day 650 - 800 bbls produced water/day</p> <p>Level controllers installed on GPU’s route gas to external vent instead of allowing to cumulate in the GPU box as seen at other facilities.</p> <p>Again no emissions noted from tanks or combustor. Trucks were onsite and unloading which can reduce pressure in tanks and VRU.</p>

Site Name(s)	Carl Rotter
Lat/Long	40.0988 / -80.5394
Date/Time	09/20/17 @ 3:18 pm
Equipment	1 wells, 1 GPUS, 4 tanks, 1 combustor, 1 heater treater, 2 compressors.
FLIR MOV_	_0335 - leak off flange on EDI compressor., _0336 – emissions off of emergency hatch on tank
Notes	<p>Production: 500 mmcf gas/day</p> <p>Emissions noted on tank and on compressor. Both emission points were tagged for repair by Mr. Brabham.</p>

Site Name(s)	Betty Schafer
Lat/Long	39.9927 / -80.6389
Date/Time	09/21/17 @ 9:28 am
Equipment	2 wells, 2 GPUS, 8 tanks, 1 combustor, 1 heater treater, 2 compressors.
FLIR MOV_	_0337 – Emissions on thief hatch of #6 produced water tank
Notes	<p>Production: 2 mmcf gas/day 60 bbls oil/day 40 bbls produced water/day</p> <p>Emissions noted on #6 water tank and #1 water tank. Hatches were tagged for repair by Mr. Brabham.</p>

Site Name(s)	Brian Dytko
Lat/Long	40.0285 / -80.6107
Date/Time	09/21/17 @ 10:28 am
Equipment	4 wells, 4 GPUS, 12 tanks, 1 combustor, 1 heater treater, 2 compressors.
FLIR MOV_	No video taken
Notes	<p>Production: 2.5 mmcf gas/day 200 bbls oil/day 100 bbls produced water/day</p> <p>Some emissions noted on produced water tank #1. Combustor operating pilot light only.</p>

Site Name(s)	Chad Glauser
Lat/Long	40.027 / -80.6107
Date/Time	09/21/17 @ 11:06 am
Equipment	5 wells, 5 GPUS, 6 tanks, 1 combustor, 1 heater treater, 1 low pressure tower.
FLIR MOV_	_0338 – Emissions on thief hatch of #3 produced water tank., -0339 - light VOC plume from combustor.
Notes	<p>Production: 4.8 mmcf gas/day 68 bbls oil/day 23 bbls produced water/day</p> <p>Emission leaks appeared to be intermittent, possibly due to timing of vapor dumps to combustor. Combustor operating with pilot light.</p>

Site Name(s)	Roy Ferrell
Lat/Long	40.0414 / -80.61.07
Date/Time	09/21/17 @ 1:05 pm
Equipment	10 wells, 10 GPUS, 16 tanks, 1 combustor, 2 heater treater, 2 compressors.
FLIR MOV_	_0340 – Emissions on thief hatch of #1 produced water tank.
Notes	<p>Production: 21 mmcf gas/day 400 bbls oil/day 200 bbls produced water/day</p> <p>A number of tanks were already tagged for repair (tag date 9/14/19). Tanks were scheduled for repair on 9/26/17.</p>

Section III – CLOSING CONFERENCE

After inspecting the Roy Ferrell site, the inspection team held a closing conference with the company at approximately 1:53 pm. The team thanked SWN staff for their help. The team then discussed the findings throughout the day, including an overview of all sites visited and emissions noted from the facility. The team discussed confidential business information. SWN did not make any CBI claims at that time.

Section IV – CONCLUSION AND AREAS OF CONCERN

The inspection team visited a total of 7 well-sites, comprising of 60 tanks, 35 wells, and 35 GPUs. Few to no emissions were noted at OCC-A and Alice Edge well sites, even though these sites had the some of the largest production. This is likely due to constant trunk unloading that prevent vapor buildup.

When emissions were noted on tanks they were mostly on the produced water tanks instead of the oil tanks. This is consistent with other facilities visited. The team discussed this with SWN staff. One reason could be that the water brine interacts with the aluminum on the thief hatch. Another reason is that the set point for the pressure relief devices is set lower on the water tanks. Finally, SWN uses the water tanks as blowdowns for the rest of the process. These blowdown events will create strong internal tank pressure. Mr. Brabham conducts regular monitoring and maintenance with all tanks and associated equipment.

The GPUs use gas-actuated level controllers, which created a source of emissions on virtually every GPU. This has been seen at well-sites nationally. However, SWN uses a GPU model that collects gas in the level controller routes it to a single vent outside of the GPU box. This prevents buildup of explosive material inside the GPU.